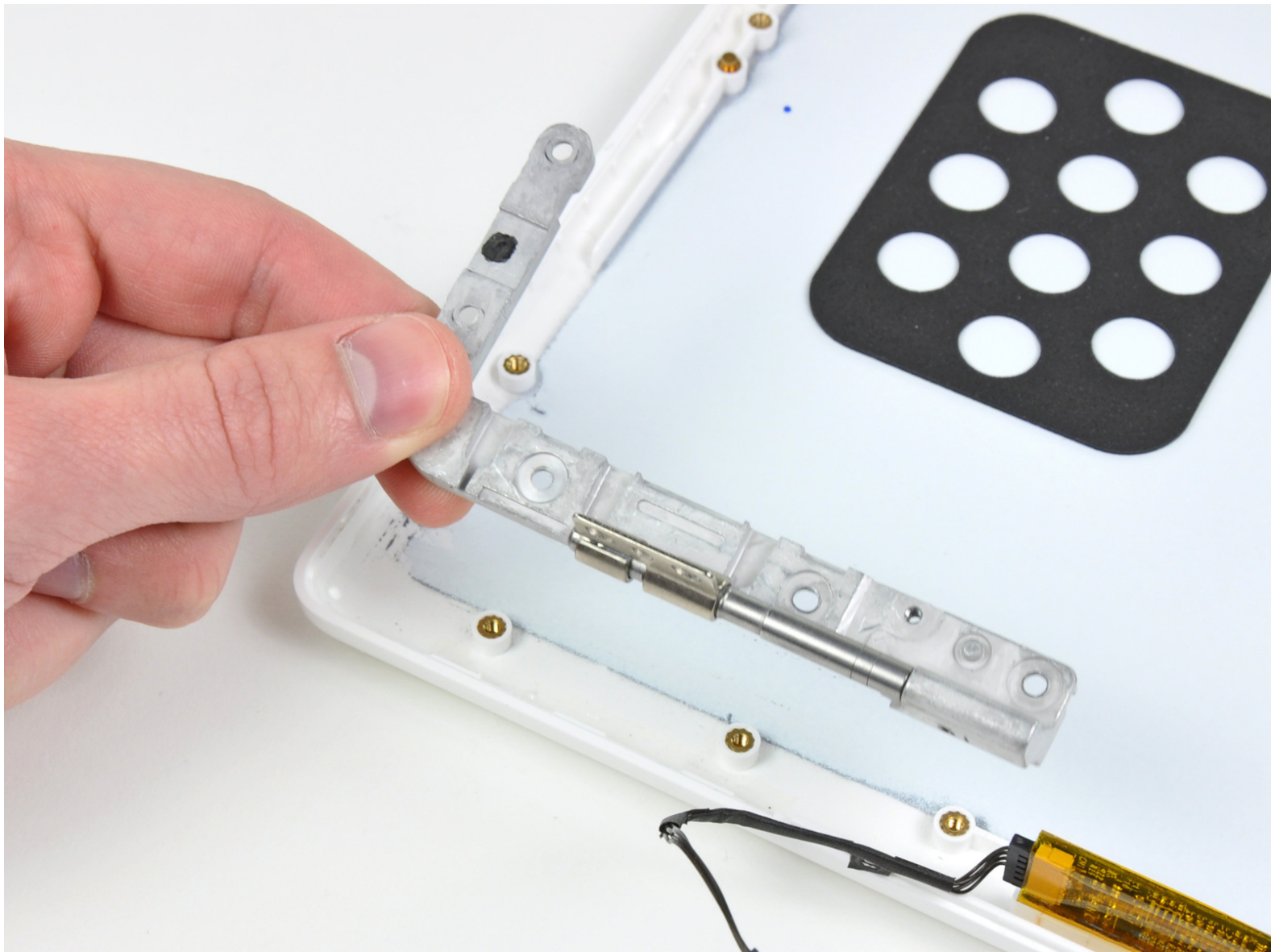




MacBook Core 2 Duo Left Clutch Hinge Replacement

Replace a broken left clutch hinge in your MacBook Core 2 Duo.

Written By: Andrew Bookholt



INTRODUCTION

Use this guide to replace a broken left hinge.



TOOLS:

- [Coin](#) (1)
- [Phillips #0 Screwdriver](#) (1)
- [Phillips #000 Screwdriver](#) (1)
- [Phillips #00 Screwdriver](#) (1)
- [Plastic Cards](#) (1)
- [Spudger](#) (1)



PARTS:

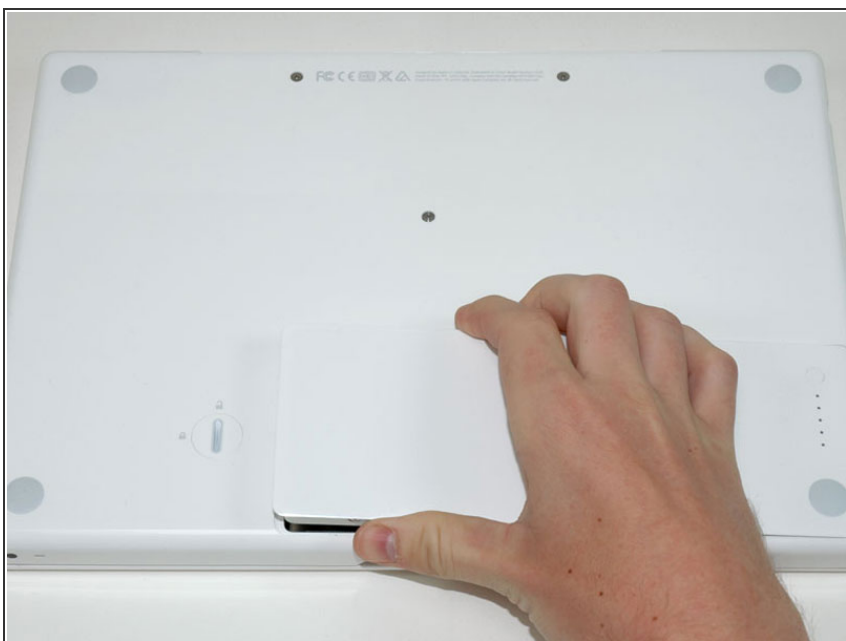
- [MacBook Left Clutch Hinge](#) (1)

Step 1 — Battery



- Use a coin to rotate the battery-locking screw 90 degrees clockwise.

Step 2



- Lift the battery out of the computer.

Step 3 — Memory Cover



- Unscrew the three evenly-spaced Phillips screws from along the rear wall of the battery compartment.
- ☑ The screws are captive to the metal memory cover so you cannot lose them.

Step 4



- Rotate the L-shaped memory cover so it clears the battery compartment opening and lift it up and out of the computer.

Step 5 — Upper Case



- Remove the following 3 screws:
 - One 11 mm Phillips#00 in the middle of the case. (Head: 5mm dia. x .75mm thick)
 - Two 14.5 mm Phillips #00 (Head: 5mm dia. x .75mm thick)
- ⓘ If the screws stick in the case, you can use a magnetized screwdriver to draw them out.
- ★ The shorter of the three screws goes in the middle.

Step 6



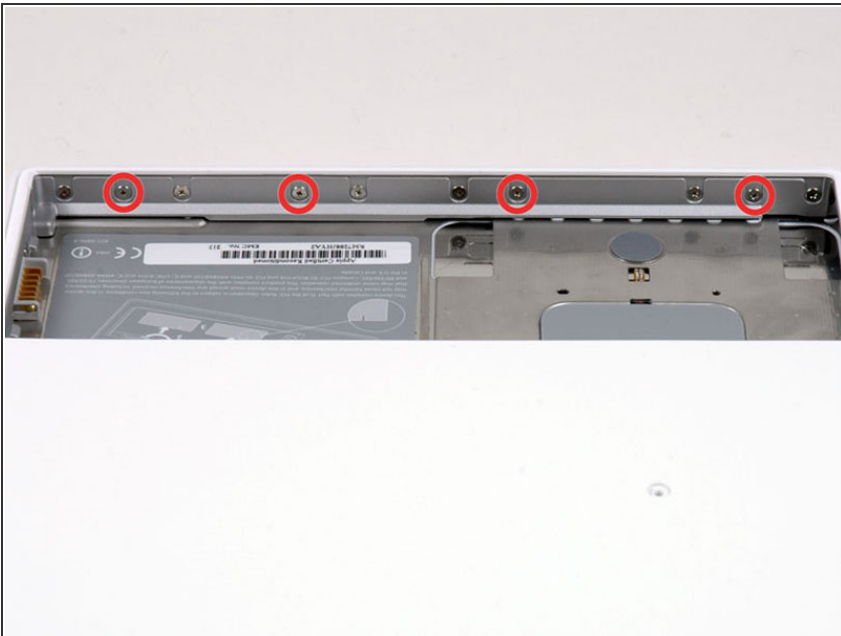
- Remove the following 3 screws from the rear wall of the battery compartment:
 - One 3 mm Phillips #0. (Head: 2.75 mm. dia.)
 - Two 4 mm Phillips #0 on the either side. (Head: 2.75mm dia.)
- ⚠ Take extra caution with these screws as they can strip easily.

Step 7



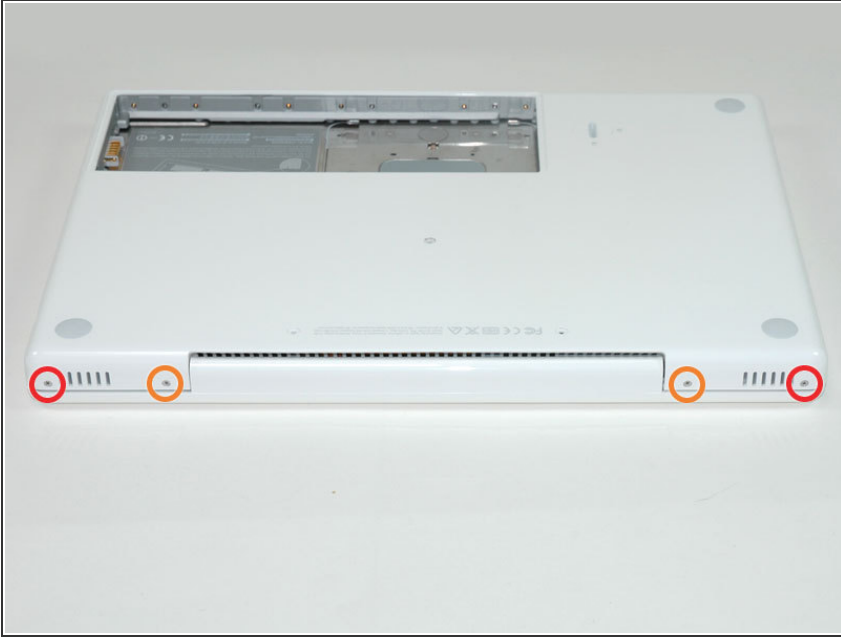
- Remove the two Phillips screws from either side of the right wall of the battery compartment (not the ones closest to the battery connector).
- Two 6.25 mm Phillips #000.
(Head: 4 mm. dia. x .5mm thick)

Step 8



- Remove the four indicated Phillips screws from the front wall of the battery compartment. When working from the left, remove the 2nd, 4th, 7th and 9th screw.
- Four 3.25 mm Phillips #000.
(Head: 4 mm. dia. x 4mm thick)

Step 9



- Remove the following 4 screws from the back of the computer:
- The longer screws go on the inside, shorter screws on the outside.
 - Two 11 mm Phillips #00, with Shank (2.2mm dia. x 2 mm len.) (Head: 3.2 mm. dia. x .5mm thick)
 - Two 7.25 mm Phillips #00, with Shank (2mm dia. x 3.75 mm len.) (Head: 3.2 mm. dia. x .5mm thick)


Step 10




- Remove the two Phillips screws from the optical drive side of the computer.
 - Two 5.2 mm Phillips #00, with Shank (2.3mm dia. x 3.5 mm len.) (Head: 3.2 mm. dia. x .5mm thick)
- ⓘ It is not necessary to remove the similar screws on the other side of the computer.


Step 11



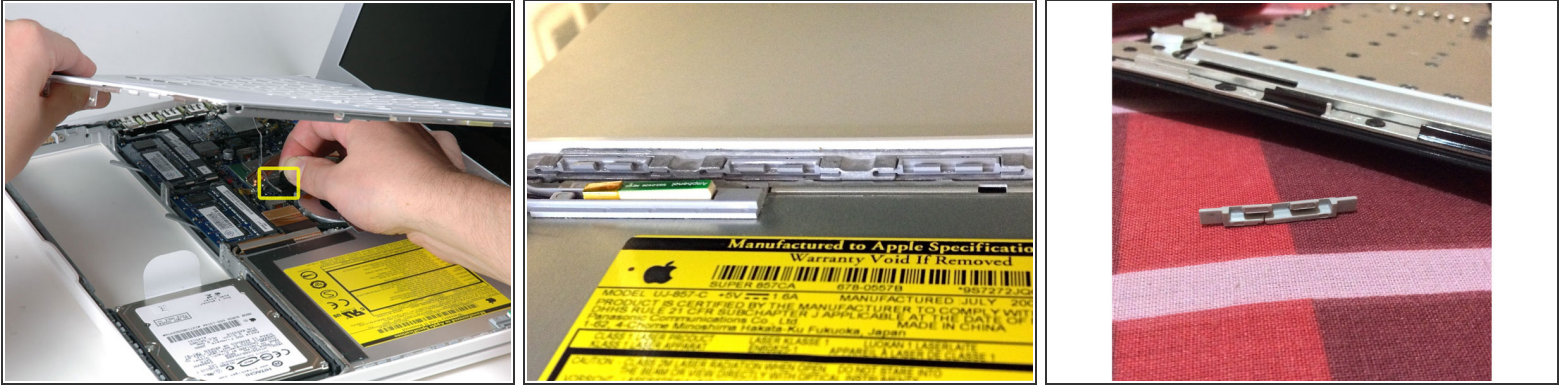
 There's a trackpad and keyboard ribbon connecting the upper case to the logic board, so don't pull the upper case off entirely just yet.

- Starting near the display and working around to the front of the computer, pry up on the upper case. A [plastic opening tool](#) or a medium hard guitar pick may help you to do this.

 The upper case is likely to stick at the connection above the optical drive. If this is the case, first free all other sides, then proceed to pull upward on the upper case from either side of the optical drive opening.

 If you stand the base on end to get a better look you may displace the total of 4 grey plastic clips that hold the keyboard in place. Don't panic. They slide into slots at the top right-most edge near the CD drive.

Step 12



- While holding up the upper case, pull up the black tab of the silver cable away from its connector.
- ⓘ If there is no black tab, you can also use a spudger to gently pry the connector from its housing. This connector is tall, so be sure to pry straight up.
- ⓘ If you happen to break your upper case cable when removing the upper case, we stock the [cable](#) individually and we have a [guide](#) that makes replacing it easy.
- While you have the upper case removed, you may want to take the opportunity to remove dust, hair, etc. It's best to use a can of compressed air, though if you use a brush, make sure that its bristles are made of a material (usually animal hair) that doesn't generate static electricity, which can destroy electronics.
- ⓘ Upon reassembly, there are 4 grey plastic clips on the optical drive side of the keyboard (refer to second picture). They must be installed in their slots for the keyboard to snap in properly.
- ⓘ To make the reassembly process easier, it's better to pull out the clips first by pulling it straight up gently. Be careful not to put too much strength because it will break.

Step 13 — Optical Drive



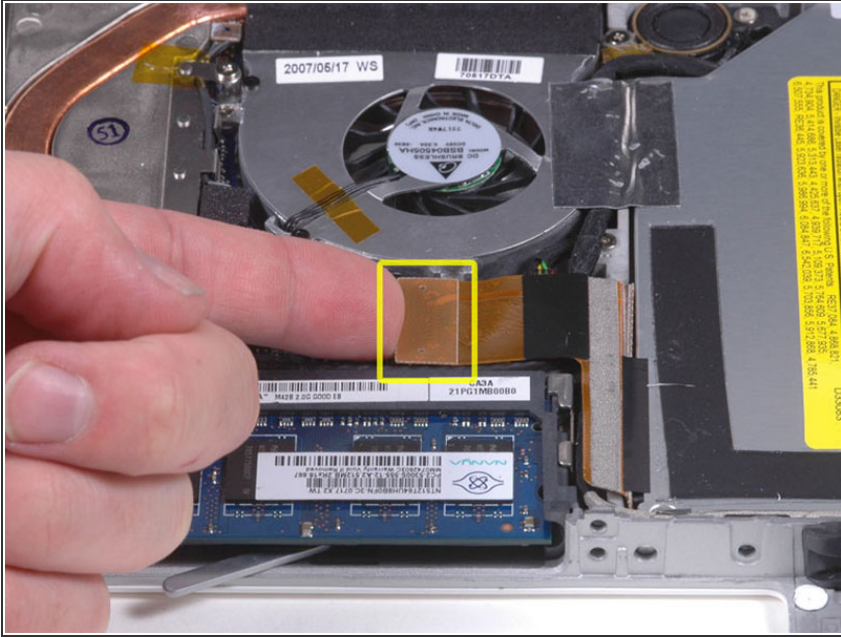
- Grasp the white plastic tab attached to the hard drive and pull it to the left, removing the hard drive from the computer.

Step 14



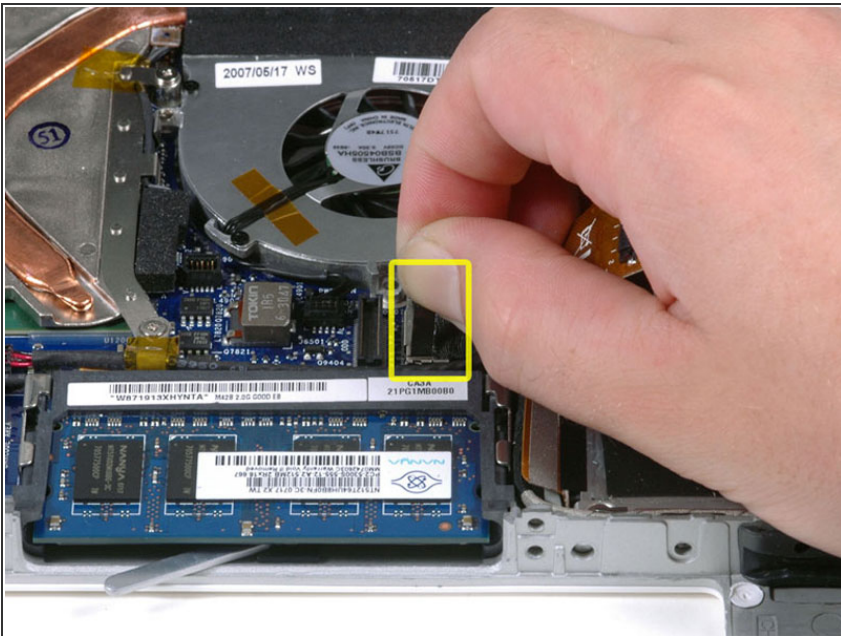
- Remove the two Phillips screws from the front edge of the optical drive.
- Two 3.25 mm Phillips #000, (Head: 4 mm. dia. x .3 mm thick)

Step 15



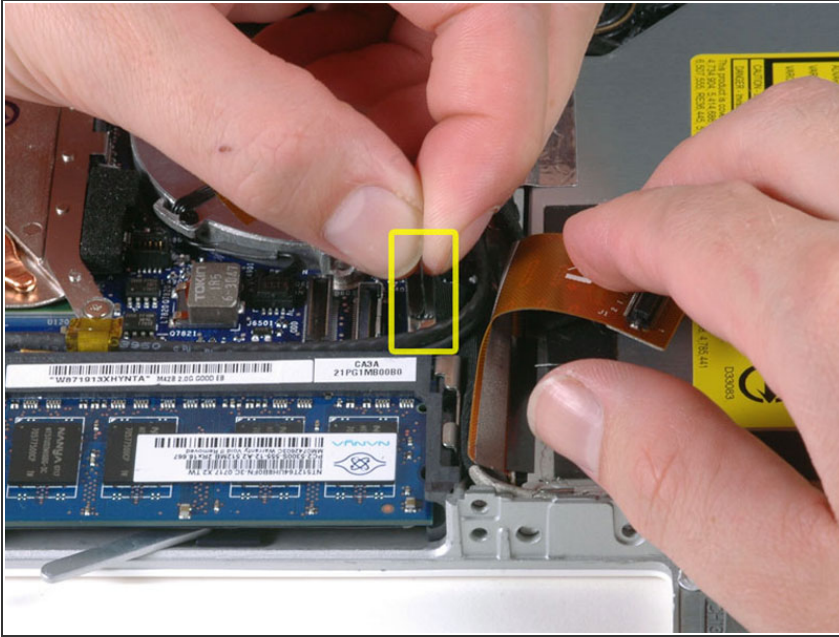
- Disconnect the orange optical drive ribbon cable from the logic board. This cable can also be disconnected by prying straight up using a spudger.

Step 16



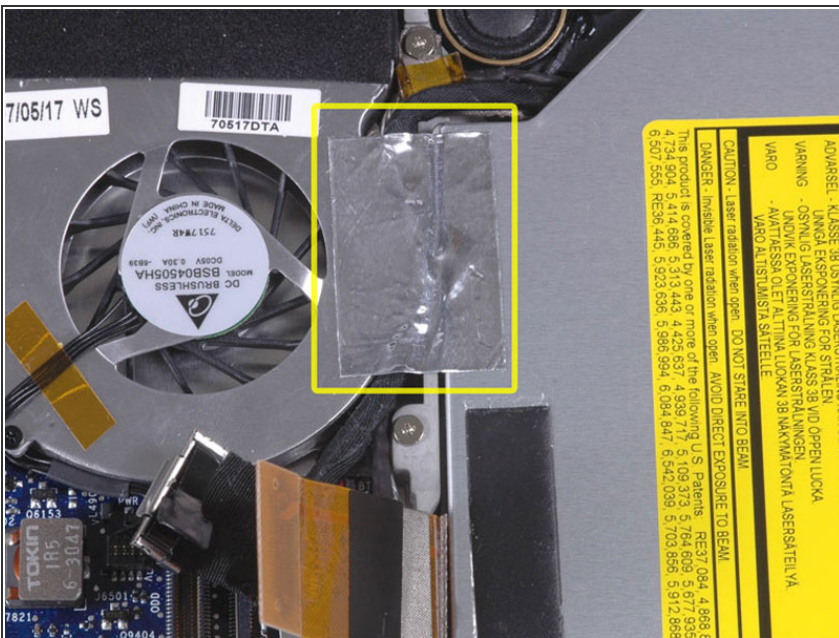
- Disconnect the newly revealed display data cable. If there is no pull-tab on the top of the connector, it may be helpful to use a spudger to disconnect this connector.

Step 17



- Disconnect the (once again) newly-revealed hard drive cable.

Step 18



- Peel up the foil tape between the fan and the optical drive. Lift the foil tape from the fan side, leaving it attached to the optical drive.
- During reassembly, be sure to route the cables beneath the tape before reattaching it.

Step 19



- Pull up the display data cable from along the edge of the optical drive to reveal a silver Phillips screw.

Step 20



- Remove the 2 mm Phillips #00 screw securing the optical drive.
- The Bluetooth cable may be covering the screw. If so, carefully push it aside. You may need to unscrew the cable clip to free the cable enough.

Screen Patching

Manufactured to
Warranty

MODEL: OW-8221-G +SV 2.0A
COMBO 8221A 67

PRODUCT IS CERTIFIED BY THE MANUFACTURER
DHS RULE 21 CFR SUBCHAPTER J APF
Panasonic Communications Co., Ltd
1-82-4 Chome Minoshima Hakata-Ku Fukuoka
JAPAN

CLASS 1 LASER PRODUCT
CLASS 1 LASER APPRAT

CAUTION - CLASS 1M LASER RADIATION WHEN OPEN
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS
VORSICHT - LASERSTRAHLUNG KLASSE 1M WENN AB
NICHT DIREKT MIT OPTISCHEN INSTRUMENTEN
ANFASSEN - KLASSE 1M LASERSTRAHLUNG VED ABFASSUNG
SEITEN MIT STRALENWEID OPTISCHE INSTRUMENTE

USER KLASSE 1
EN60825-1

- Deroute the hard drive cable from along the front of the optical drive.

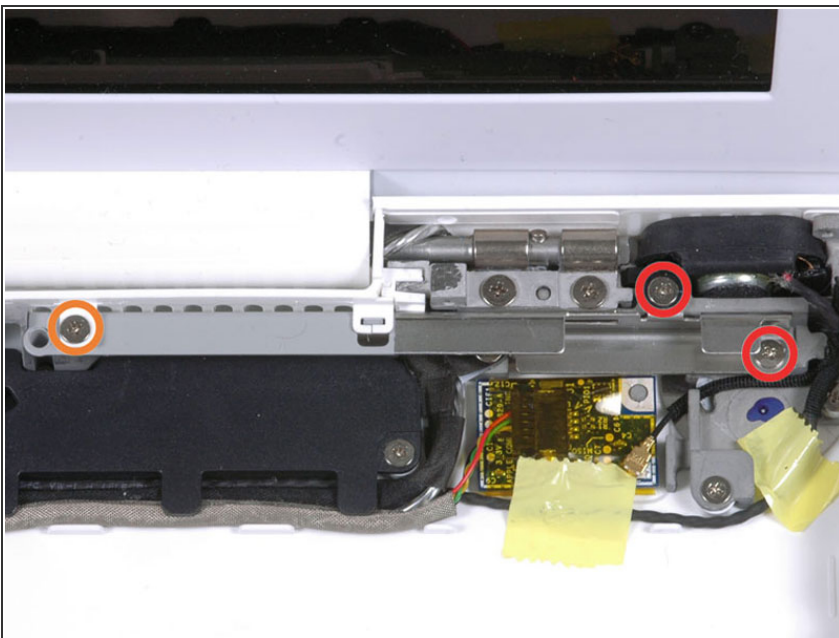
- Deroute the hard drive cable from along the front of the optical drive.

Step 23



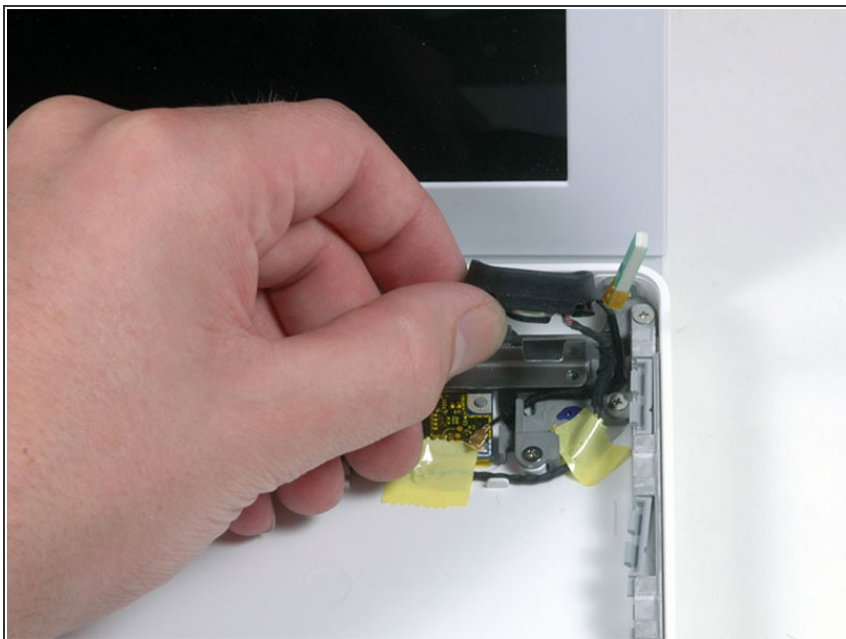
- Lift the front edge of the optical drive and slide it up and out of the computer.

Step 24 — C-Channel



- Remove the following 3 screws:
 - Two 3 mm Phillips near the right speaker.
 - One 6 mm Phillips threaded through a hole in a plastic finger above the subwoofer.
- ⚠ Be careful not to over-tighten the screw above the subwoofer too tight or the plastic could crack.
- ⓘ Santa Rosa and Penryn MacBooks do not have a c-channel. If you are disassembling either of these models, remove only the single 3 mm Phillips screw from the right speaker and skip step 26.

Step 25



- Lift the right speaker out of its housing and set it to the side.

Step 26



- ⓘ If you have a Santa Rosa/Penryn model, skip this step.
- Using a spudger, gently pry up the white plastic slot and slide the metal c-channel to the right and away from the display.

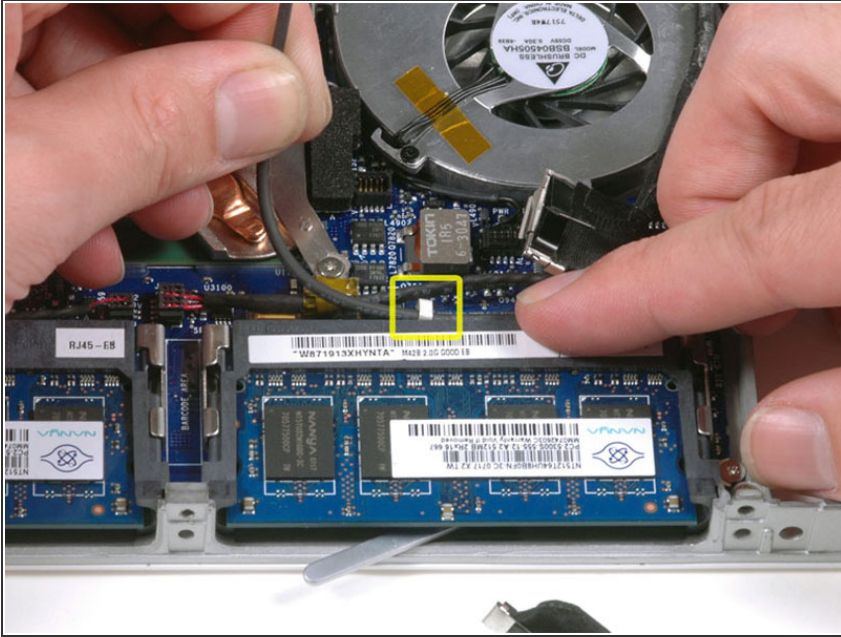
Step 27 — Display



- Use a spudger to carefully disconnect the microphone cable from the logic board. You'll want to work from side to side, and slowly wiggle the connector out of its socket.

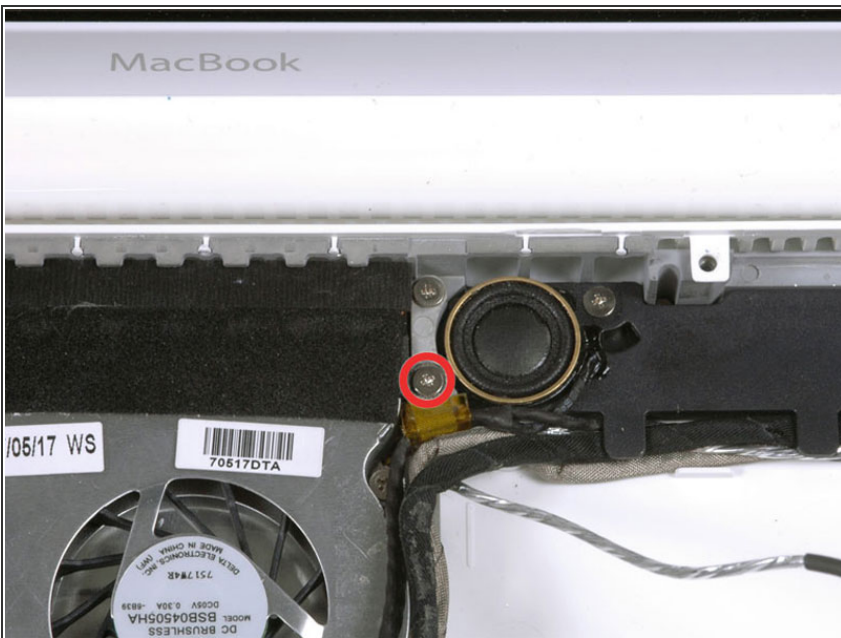
⚠ Pulling on this connector vertically will break the socket off the logic board. This connector should be removed horizontally by gently pulling the microphone cable toward the screen while working a spudger between the connector and the socket.

Step 28



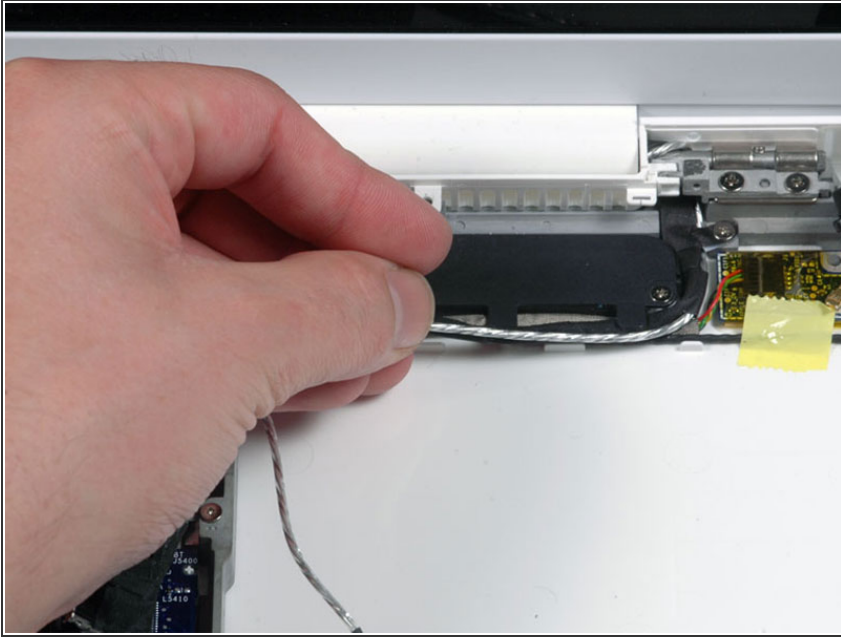
- Lift up on the black right speaker cable with one hand, and deroute the microphone cable from the silver metal clip just above the right RAM slot.
- ⓘ This metal clip may not be present in all models. Be sure that the cable is free from any hold downs around this area before proceeding.

Step 29



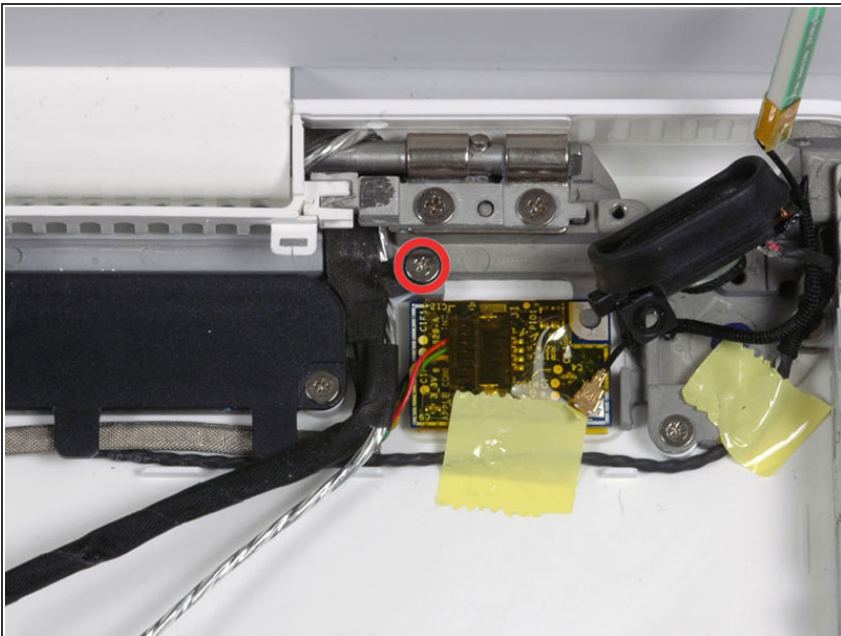
- If you didn't remove the ground loop screw in step 20 above, remove it now. It's a 7 mm (may be 4.2 mm in Santa Rosa/Penryn models) Phillips screw securing the ground loop in the right speaker cable and microphone cable to the metal framework.

Step 30



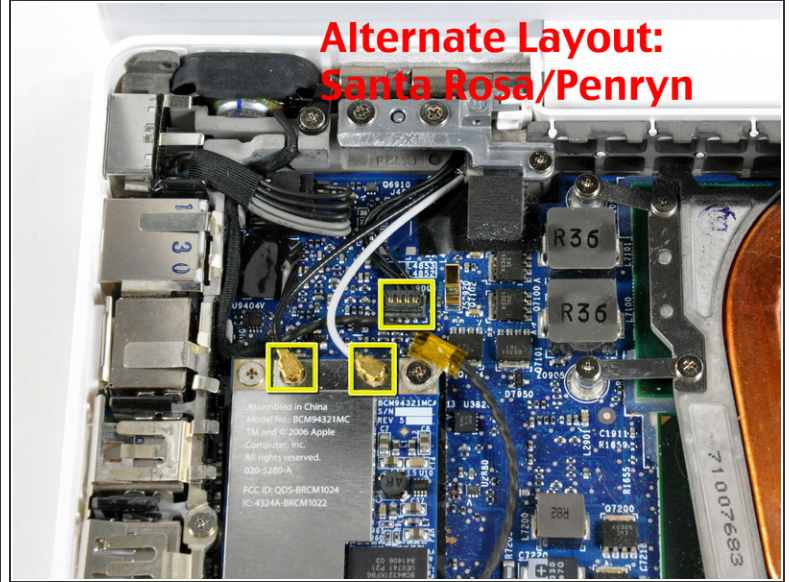
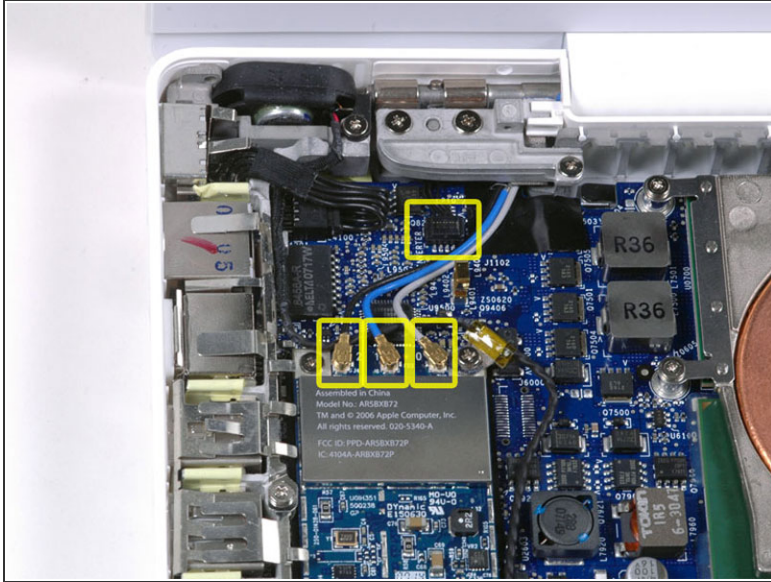
- Deroute the microphone cable and the black display data cable from the tabs at the bottom of the subwoofer.

Step 31



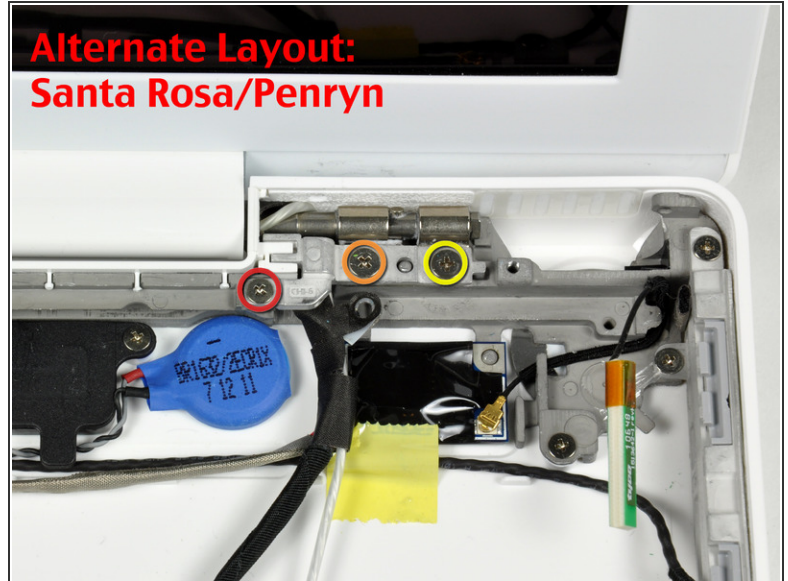
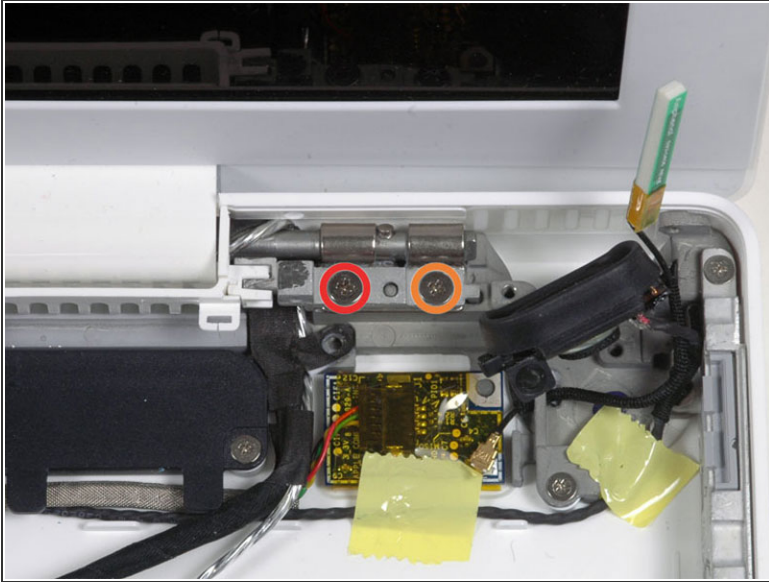
- Remove the single 3 mm Phillips screw securing the ground loop in the display data cable located just above the Bluetooth board.

Step 32



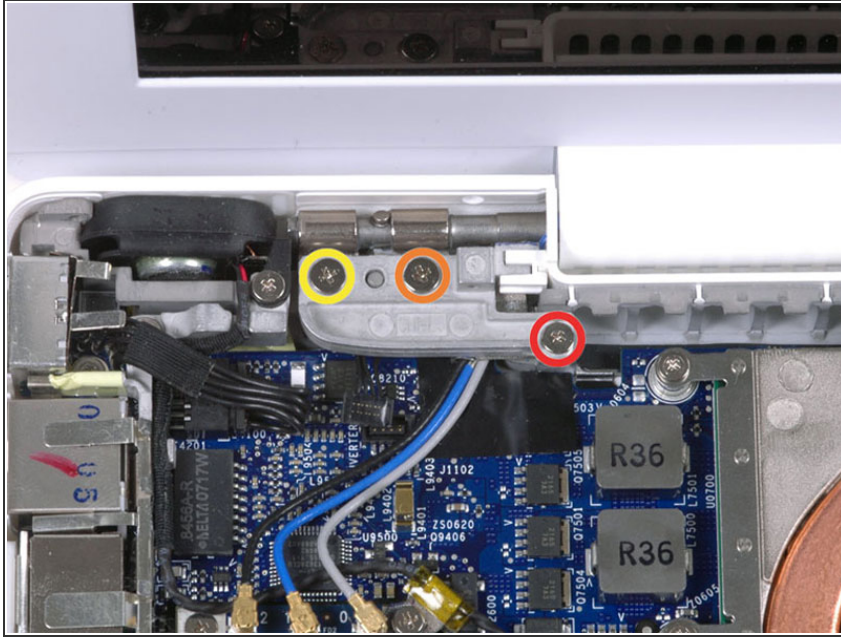
- Disconnect the three antenna cables from the Airport card. There may be a square foam piece over the logic board connector.
- ⓘ Disconnect the inverter cable from the socket by inserting the spudger between the right or left edge of the plug and the socket, and prying gently upward. (Do NOT pry the entire socket off the board... you must pull the plug from within the socket.) The inverter plug lifts vertically out of the socket. Do not pull it in the direction of the connecting wires or you will tear the socket off.
- ⓘ If you have a MacBook Core 2 Duo Santa Rosa/Penryn, there are only two antenna cables and the black inverter cable is in a different location.

Step 33



- Remove the following 2 screws from the right hinge mount:
 - One 6 mm Phillips on the left side of the hinge mount.
 - One 10 mm Phillips on the right side of the hinge mount.
- For Santa Rosa/Penryn models, see second picture and remove:
 - One 3 mm smaller diameter Phillips on the far left.
 - One 5.2 mm larger diameter 4.2 mm head Phillips in the middle.
 - One 10 mm Phillips from the far right.
- Lift the right hinge mount with the small plastic piece out of the computer.

Step 34



- Hold the display with one hand while removing the screws from the left hinge mount.
- Remove the following 3 screws from the left hinge mount:
 - One 7.2 mm smaller diameter Phillips from the right side.
 - One 5.2 mm larger diameter Phillips from the middle.
 - One 10 mm Phillips from the left side.
- Lift the left hinge mount with plastic piece out of the computer.
- Check that the cables on the right are not trapped under other cables.

Step 35



- Grasp the display assembly on either side, and lift it up and out of the computer.

Step 36 — Front Display Bezel



- i** The following steps should be identical for both white and black MacBooks.
- Use a thin plastic card to release the tabs holding the front display bezel to the display assembly. There are five tabs along the left side of the display bezel.
- !** Don't use a card that cannot be replaced if damaged. The clips can be difficult to remove and the card can bend and break, rendering it useless.

Step 37



- Continue to free the tabs along the top edge of the display assembly.
- !** Be careful when working near the iSight camera.

Step 38



- Next, free the five tabs securing the display bezel on the right side.

Step 39



- Lift up the front display bezel from the top and use your plastic card to free the tabs along the bottom edge of the display bezel.
- ⓘ Make sure that your card is between the metal frame around the LCD panel and the display bezel and not touching the LCD panel itself.
- After freeing all holding tabs, lift the front display bezel away from the display assembly.

Step 40



- i** Sometimes when removing the front display bezel, the retaining clips that should remain captive in the LCD brackets come out with the front display bezel. Follow this and the next step to transfer the clips back to the LCD bracket.
- Use a metal spudger or another thin tool to carefully pry the gray plastic clips off the tabs molded into the front display bezel. A 0.8mm flat screwdriver may be useful for this step.
- !** Be careful, as the clips are made of thin plastic and are inherently delicate.

Step 41



- Insert the longer end of the retaining clip beneath the edge of its recess cut into the LCD bracket.
 - Use the edge of a metal spudger to push the shorter tab on the other side of the retaining clip into the recess cut into the LCD bracket.
- i** The second picture shows the LCD bracket properly installed.

Step 42 — Clutch Cover



- Remove the three 4.2 mm Phillips screws securing the clutch cover.

Step 43



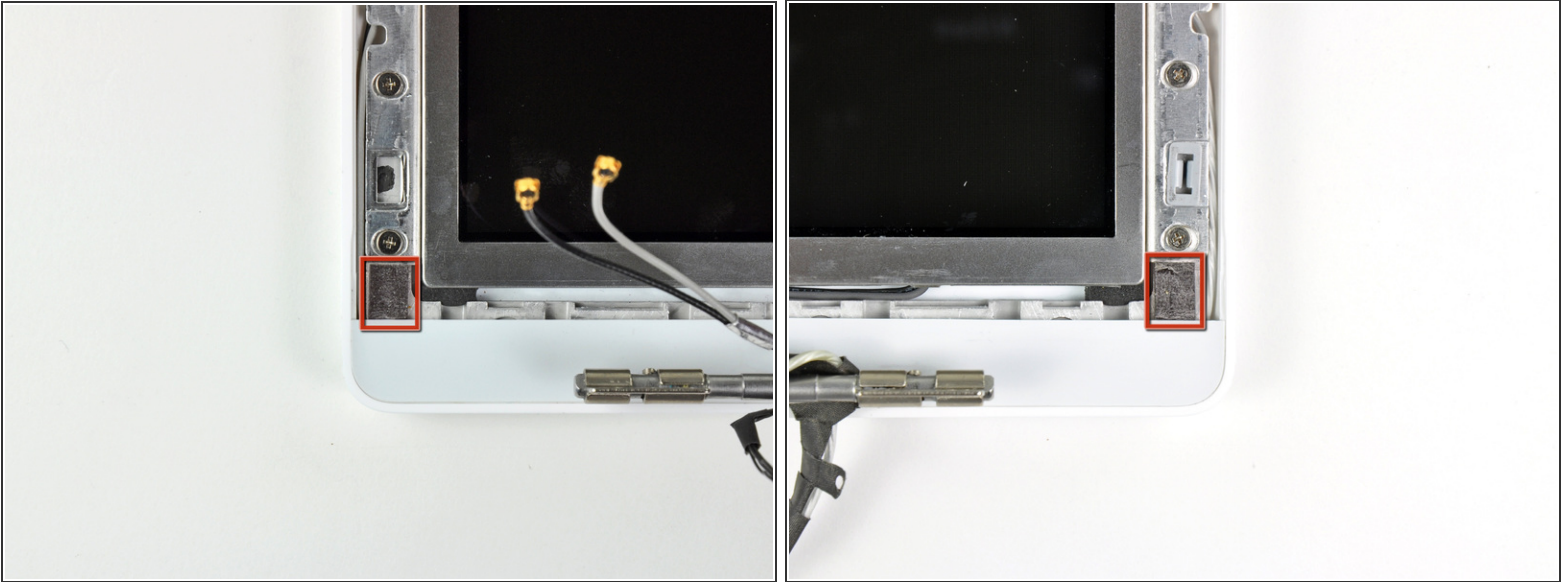
- While holding the display down with one hand, use your other hand to lift the clutch cover off the clutch hinges.
- ⓘ It may help to wiggle the clutch cover as you pull it up from the display.

Step 44



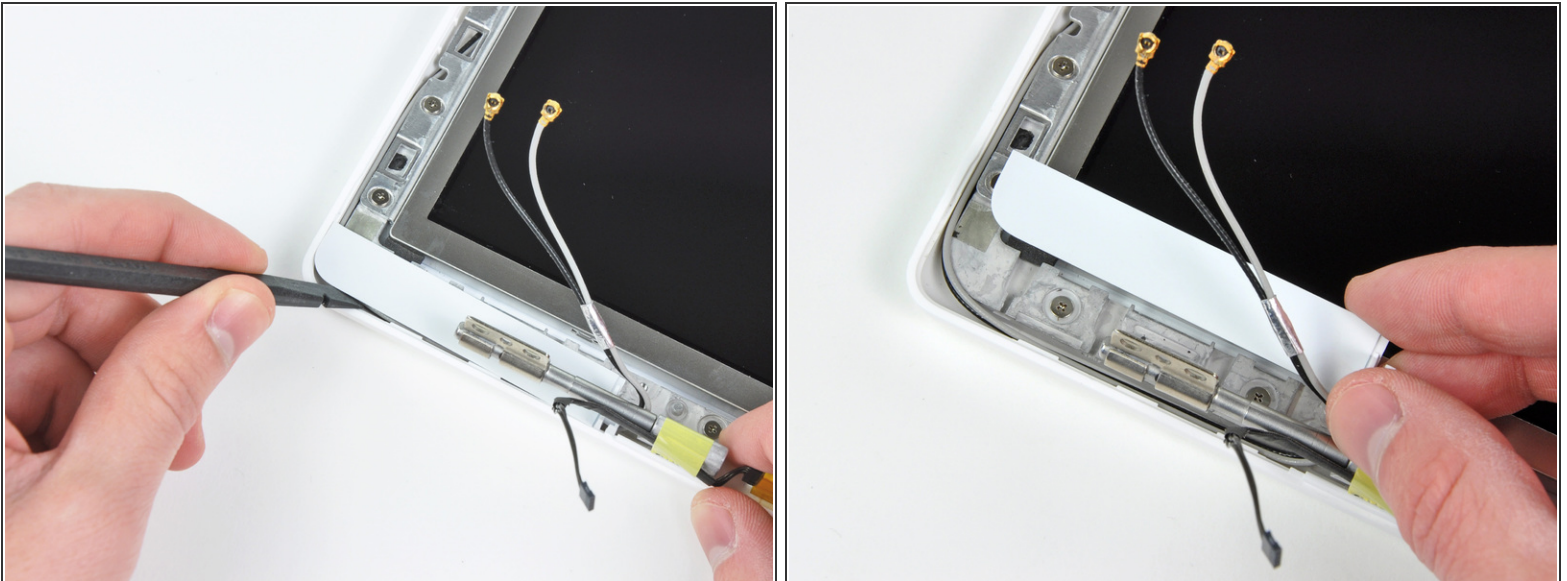
- Lift up the right side of the clutch cover and guide the display data and iSight cables through the gap in the clutch cover.
- Lift the clutch cover out of the display assembly.
- ★ During reassembly, make sure not to pinch the backlight cable (with the white connector) when snapping the clutch cover back into place. This cable has two visible wires leading into the lower right section of the LCD display to the backlight. (The models with pink and white wires are usually longer and easier to pinch.)

Step 45 — LCD Assembly



- Remove the small piece of foam tape stuck down above each of the bezel covers.

Step 46



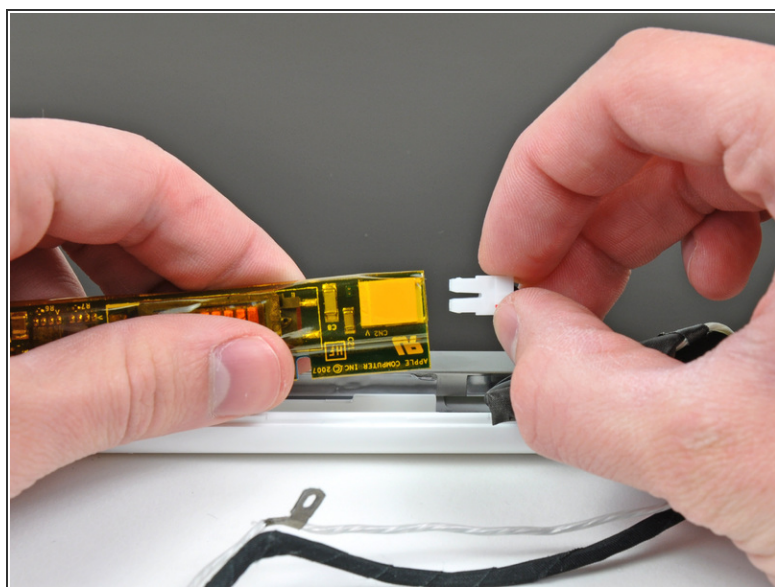
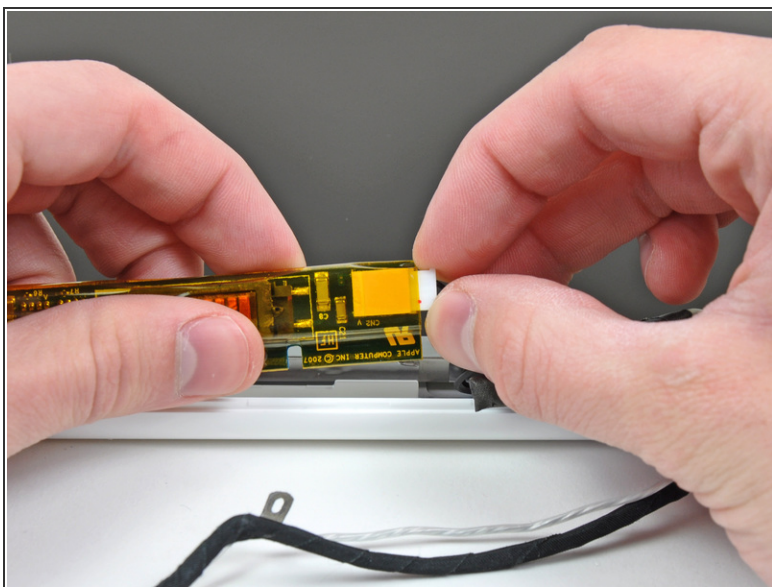
- Use a spudger to slide the left bezel cover towards the LCD panel.
- ⚠ Do not lift up vertically on the cover! Unlike the large display bezel, this one has horizontal hooks to keep it in place. These will break easily.
- Lift the left bezel cover off the display assembly.

Step 47



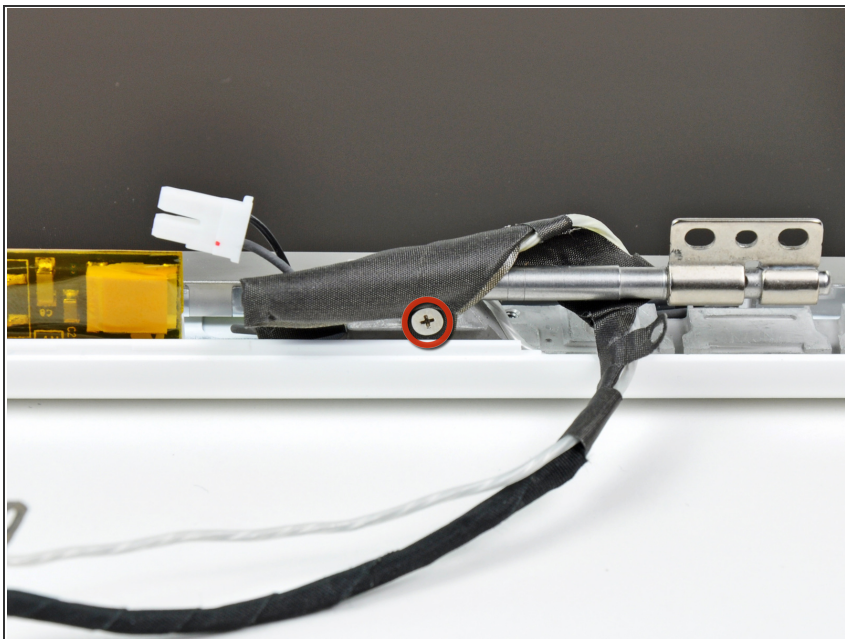
- Use a spudger to slide the right bezel cover toward the LCD panel.
- Lift the right bezel cover off the display assembly.

Step 48



- Lift the inverter out of the display slightly and disconnect the backlight cable from its right side.
- Place the inverter back down in its recess.

Step 49



- Remove the single 3.2 mm Phillips screw securing the display data cable to the right clutch hinge.

Step 50



- Move the display data cable out from under the mounting arm of the right clutch hinge.

Step 51



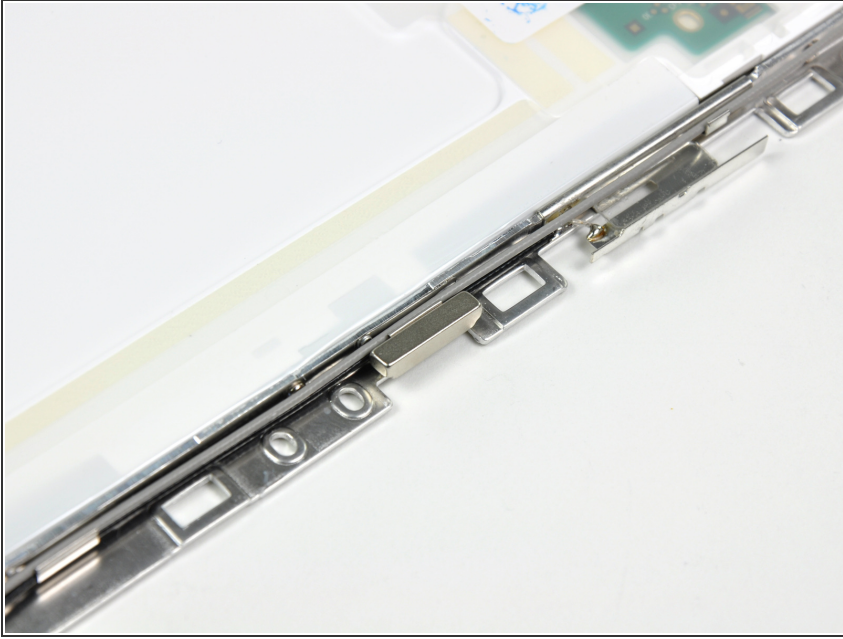
- Remove the twelve 4.2 mm Phillips screws securing the LCD assembly to the rear display bezel.
- ⓘ Make sure you pay attention to how the microphone cable (and antenna cable on some models) are routed around the outside of the two screws nearest to the bottom of the screen (on both left and right). It's easy to damage the cables if not routed properly when putting these screws back on.

Step 52



- Lift the LCD assembly out of the rear display bezel, minding any cables that may get caught.

Step 53



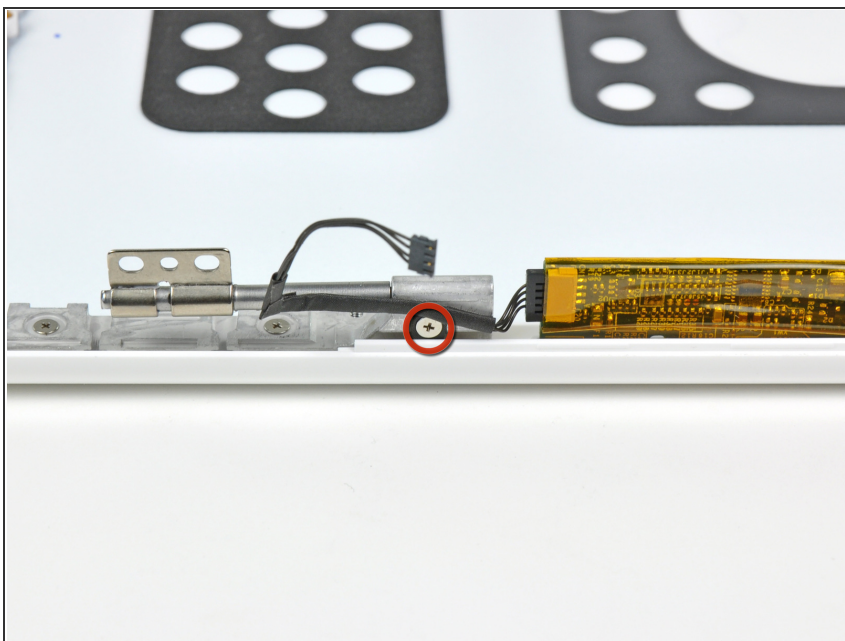
- ★ Be sure to keep track of the small magnet along the left side of the display. It may be stuck to the LCD frames or to the rear display bezel. When installing it, be sure short side is facing upward.

Step 54 — Left Clutch Hinge



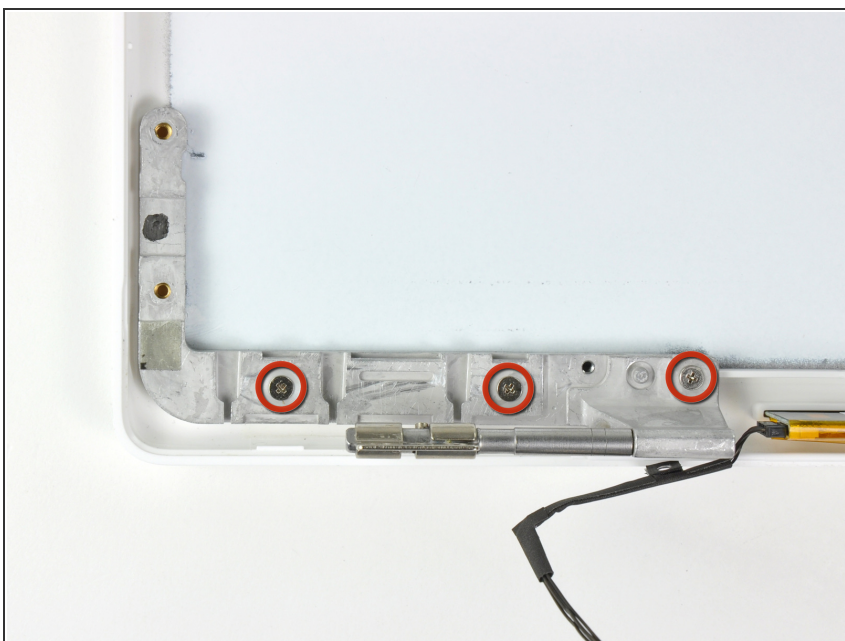
- Remove the piece of tape stuck to the left clutch hinge.

Step 55



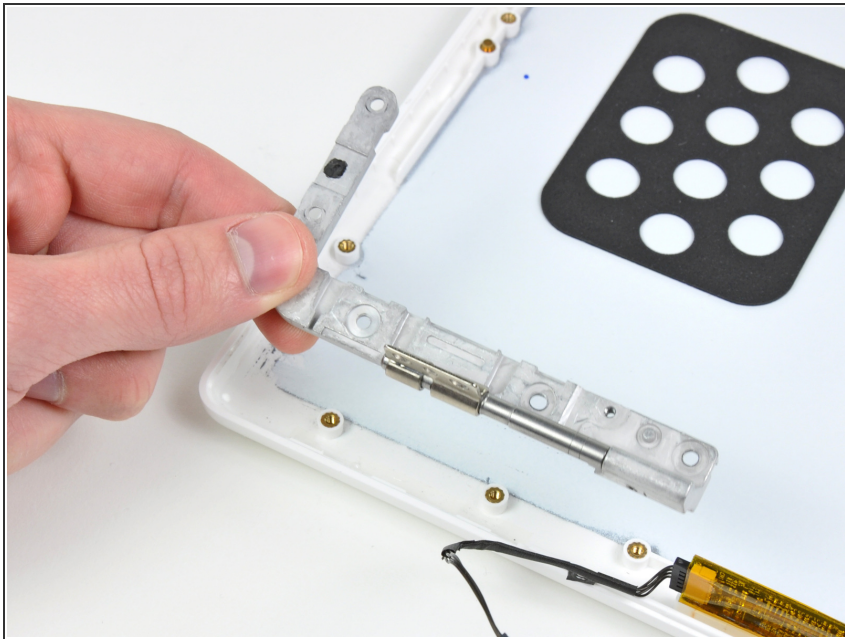
- Remove the single 3.2 mm Phillips screw securing the inverter cable to the left clutch hinge.

Step 56



- Remove the three 3.2 mm Phillips screws securing the left clutch hinge to the rear display bezel.

Step 57



- Remove the left clutch hinge from the rear display bezel.

To reassemble your device, follow these instructions in reverse order.

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